

## NOTES ON GEOGRAPHIC DISTRIBUTION

### Insecta, Ephemeroptera: range extensions and new Iowa state records

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A comprehensive inventory of the mayflies (Ephemeroptera) occurring in the state of Iowa was given by McCafferty et al. (2003), as part of a series on the mayfly fauna of the Great Plains of the U.S.A. Other completed studies in this series have included Nebraska (McCafferty et al. 2001) and North Dakota (Guenther and McCafferty 2005), and South Dakota is in preparation at this time. McCafferty et al. (2003) listed 106 species from Iowa; however, taxonomic revisions, new collections, and errors discovered since then require updating of the list of Iowa mayflies as follows: Due to recent revisions, two species must be deleted from the Iowa list. These include *Procleon irrubrum* Lowen and Flannagan because it was synonymized with *P. viridoculare* (Berner), which was already known from Iowa (Wiersema and McCafferty 2004), and *Ephemerella inermis* Eaton because it was synonymized with *E. excrucians* Walsh, which was already known from Iowa (Jacobus and McCafferty 2003). Another synonym that involves Iowa mayflies is that of *Centroptilum walshi* McDunnough with *C. album*, although this does not affect the number of species, because only *C. walshi* was recorded from Iowa. The only other necessary deletion involves *Serratella molita* (McDunnough), which we have determined was based on a misidentification of immature larvae of *Ephemerella needhami* McDunnough, a species that was already known from Iowa. Generic recombinations that involved Iowa species since McCafferty et al. (2003) were Wang and McCafferty (2004) as regards *Maccaffertium* Bednarik [i.e., all previous *Stenonema* Traver species transferred except *S. femoratum* (Say)], and McCafferty et al. (2005) as regards

*Heterocloeon* McDunnough [i.e., *Acentrella ampla* Traver is now *H. amplum* (Traver)]. These works affected Iowa species names but not numbers. Published additions to the known fauna included *Heterocloeon anoka* (Daggy) (McCafferty et al. 2004) and *C. triangulifer* (McDunnough) (Wiersema and McCafferty 2004).

The substantive deletions and additions to the Iowa fauna reviewed above would bring the number of known species to 105 prior to the present report. We are able to provide records of four additional mayfly species below, bringing the total known Iowa fauna to 109. All records refer to larvae deposited at the Hygienic Laboratory at the University of Iowa, and are given in alphabetical order.

### Baetidae

*Dipheter hageni* (Eaton). Winneshiek County, Ten Mile Creek, Decorah, 23-VIII-2005. This is a transcontinental species, recently reviewed by Meyer and McCafferty (2001), that was expected to occur in Iowa.

*Procloeon rubropictum* (McDunnough). Van Buren County, Cedar Creek, Stockport, 20-VII-2005. This is essentially an eastern North American species, and Iowa along with Missouri and Oklahoma form its westernmost range in the U.S.A., although it is known farther west from Saskatchewan in Canada (McCafferty and Randolph 1998).

### Leptophlebiidae

*Leptophlebia intermedia* (Traver). Linn County, Cedar River, West of Center Point, 18-IV-2004. This is an eastern North American species. Texas, Oklahoma, and Missouri, along with Iowa form its westernmost range in North America.

### Oligoneuriidae

*Homoeoneuria alleni* Pescador and Peters. Ida County, Maple River, 5-VIII-1997. This species was previously reported as *H. ammophila* (Spieth) from western Iowa (McCafferty and Hubbard 1998); however, *H. ammophila* is restricted to the Mississippi River drainage system in Iowa [e.g., Des Moines County, as previously reported by McCafferty et al. (2003)], whereas *H. alleni* is



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found in the more western Missouri River drainage system in that state. The records of *H. ammophila* in Nebraska (McCafferty et al. 2001) (all in the Missouri River drainage system) also are corrected to *H. alleni*. Far western Iowa now constitutes the easternmost known range of *H. alleni* (McCafferty et al. 2002).

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### Literature Cited

- Guenther, J. L. and W. P. McCafferty. 2005. Mayflies (Ephemeroptera) of the Great Plains. III: North Dakota. Transactions of the American Entomological Society 131: 491-508.
- Jacobus, L. M. and W. P. McCafferty. 2003. Revisionary contribution to the North American *Ephemerella* and *Serratella* (Ephemeroptera: Ephemerellidae). Journal of the New York Entomological Society 111: 174-193.
- McCafferty, W. P. and T. Hubbard. 1998. Additions to Iowa mayflies (Ephemeroptera). Entomological News 109: 268.
- McCafferty, W. P. and R. P. Randolph. 1998. Canada mayflies: a faunistic compendium. Proceedings of the Entomological Society of Ontario 129: 47-97.
- McCafferty, W. P., T. H. Klubertanz, R. P. Randolph, A. V. Provonsha, H. R. Lawson, and B. C. Kondratieff. 2001. Mayflies (Ephemeroptera) of the Great Plains. I. Nebraska. Transactions of the American Entomological Society 127: 5-29.
- McCafferty, W. P., M. D. Meyer, and G. T. Lester. 2002. Significant range extensions for southwestern Nearctic mayflies (Ephemeroptera: Baetidae). Entomological News 113: 211-214.
- McCafferty, W. P., T. Hubbard, T. H. Klubertanz, R. P. Randolph, and M. Birmingham. 2003. Mayflies (Ephemeroptera) of the Great Plains. II: Iowa. Transactions of the American Entomological Society 129: 77-105.
- McCafferty, W. P., M. D. Meyer, J. M. Webb, and L. M. Jacobus. 2004. New state and provincial records for North American small minnow mayflies (Ephemeroptera: Baetidae). Entomological News 115: 93-100.
- McCafferty, W. P., R. D. Waltz, J. M. Webb, and L. M. Jacobus. 2005. Revision of *Heterocloeon* McDunnough (Ephemeroptera: Baetidae). Journal of Insect Science 5(35).
- Meyer, M. D. and W. P. McCafferty. 2001. Hagen's small minnow mayfly (Ephemeroptera: Baetidae) in North America. Entomological News 112: 255-263.
- Wang, T. Q. and W. P. McCafferty. 2004. Heptageniidae (Ephemeroptera) of the world. Part I: Phylogenetic higher classification. Transactions of the American Entomological Society 130: 11-45.
- Wiersema, N. A. and W. P. McCafferty. 2004. New synonyms and records of North American *Centroptilum* and *Procloeon* (Ephemeroptera: Baetidae). Entomological News 115: 121-128.

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